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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/772,380	02/06/2004	Shih-Fan Kuan	KUAN3007/EM	5744
23364	7590	11/29/2004	EXAMINER	
BACON & THOMAS, PLLC 625 SLATERS LANE FOURTH FLOOR ALEXANDRIA, VA 22314			LEE, CALVIN	
			ART UNIT	PAPER NUMBER
			2825	

DATE MAILED: 11/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/772,380

Applicant(s)

KUAN et al.

Examiner

Lee, Calvin

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

OFFICE ACTION***Claim Rejections - 35 U.S.C. § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Note: This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a)

2. Claims 1-10 are rejected under 35 U.S.C. 102(e) as anticipated by *Tung et al.*

a) *Tung et al (US 2004/0051183)* discloses a method of forming a memory gate structure:

-forming a plurality of gates on the surface of a substrate **2**, wherein each gate having in sequence a poly-Si layer **4**, a tungsten silicide WSi_2 layer **6** and a SiN protecting layer **8** [Fig. 3A]

-forming a photoresist layer **22** of a predetermined pattern on the surface of the substrate and on the gates to selectively form an opening between the two adjacent gates [¶ 0054]

-using a solution of NH_4OH to remove a portion of the WSi_2 layer adjacent to the opening [pg. 3]

-removing the photoresist layer [¶ 0056]

-forming SiN spacers **10** on the gates' sidewalls before forming bit lines **14** thereon [Fig. 3F]

b) In re claim 8, since about 1/8 of the WSi_2 layer is removed [Fig. 5B and ¶ 0069], the removed portion of the metal layer is definitely less than 20% of the total metal layer.

Claim Rejections - 35 U.S.C. § 102 or 103(a)

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-7 and 9-10 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over *Kuo (US 5,989,987)* in view of *Tung et al.*

a) *Kuo* discloses a method for manufacturing a gate structure of a memory, comprising of:

-forming a plurality of gates on the surface of a substrate **20**, wherein each gate having in sequence a poly-Si layer **21**, a tungsten silicide WSi_2 layer **22** and a SiN protecting layer **23** [Fig. 2A]

-forming an opening between the two gates [Fig. 1B]

-using a solution of NH_4OH to remove a portion of the WSi_2 layer adjacent to the opening [col. 3]

Kuo discloses "performing a photolithographic and etching process to remove selected portions of these layers" [col. 3, ln.26], but is silent about a photoresist formation and removal.

Nevertheless, such self-aligned contact formation using a photoresist is known in the semiconductor etching process as evidenced by *Tung et al* disclosing to use a patterned photoresist layer 22 on a substrate 20 and gates to form an opening between the two gates [¶ 0054] then to remove the photoresist layer after a portion of the WSi_2 layer 6 has been removed [page 3].

It would have been obvious to one having ordinary skill in the art to have modified the gate structure formation of *Kuo* by utilizing a photoresist layer, which is widely used in the self-aligned contact formation [col. 1, ln.38 in *Kuo*]. The motivation to do so would have been to form a well-apart opening between adjacent gates for a subsequent bit line formation.

b) In re claim 10, *Kuo* suggests an SiO spacer 24 on the gates' sidewalls [col. 3, ln.44], but not an SiN spacer. *Tung et al* suggests an SiN spacer on the gate's sidewall [¶ 0057].

It would have been obvious to one of ordinary skill in the art to combine the teachings of *Kuo* and *Tung et al*, and thus arrive at the claimed invention, since it has been held to be within the general skill of a worker in the art to select a known material of the spacer on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 SUPQ 416.

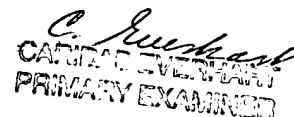
Contact Information

5. Any inquiry concerning this communication from the Examiner should be directed to *Calvin Lee* at (571) 272-1896 from 7:00 to 17:00 (Monday-Thursday, Eastern Time). If attempts to reach the examiner by telephone are unsuccessful, Art Unit 2825's Supervisory Patent Examiner *Matthew Smith* can be reached at (571) 272-1907.

Any inquiry relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0596. The central fax number is (703) 872-9306 for all communications to be entered (e.g., amendments, remarks, IDS, etc.)



November 16, 2004



CALVIN LEE
PRIMARY EXAMINER